

Sep 23 2003

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

Substitute for form 1449/PTO

Complete if Known
Application Number NEW APPLICATION
Filing Date HEREWITH
First Named Inventor Milan R. Kokta
Attorney Docket Number 1035-BI3918-CIP

Sheet 1 of 3
(use as many sheets as necessary)

U.S. PATENT DOCUMENTS

Examiner Initials *	Cite No. 1	U.S. Patent Document Number	Kind Code 2 (if known)	Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
JW	AA	3,655,439		SEITER	04/11/1972	—
	AB	3,658,586		WANG	04/25/1972	—
	AC	3,796,597		V.R. PORTER, et al.	03/12/1974	—
	AD	4,177,321		NISHIZAWA	12/04/1979	—
	AE	5,741,724		RAMDANI, et al.	04/21/1998	—
	AF	5,850,410		KURAMATA	12/15/1998	—
	AG	5,530,267		BRANDLE, JR., et al.	06/25/1996	—
	AH	6,104,529		BRANDLE, JR., et al.	08/15/2000	—
	AI	3,883,313		CULLEN, et al.	05/13/1975	—
	AJ	5,802,083		BIRNBAUM	09/01/1998	—
	AK	2003/0007520	A1	KOKTA, et al.	01/09/2003	—

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JW	AL	EP	0 148 656	A1	AUZEL, et al.	11/16/1984		<input type="checkbox"/>
	AM							<input type="checkbox"/>

PUBLICATIONS

Examiner Initials *	Cite No. 1	Title of Publication	Date of Publication of Cited Document MM-DD-YYYY
JW	AV	YUMASHEV K.V., et al., "Co ²⁺ -doped spinels saturable absorber Q-switches for 1.3-1.6 μ m solid state lasers", OSA TRENDS IN OPTICS AND PHOTONICS. ADVANCED SOLID STATE LASERS., Vol. 34, pp. 236-239, 2000. XP008017966	—
	AW	YUMASHEV, K.V., et al., "Passive Q-switching of 1.34- μ m neodymium laser using Co ²⁺ :LiGa ₅ O ₈ and Co ²⁺ :MgAl ₂ O ₄ ", CONFERENCE DIGEST, 2000, 1 page. XP002242959	—
	AX	OKTYABRSKY, S., et al., "Crystal structure and defects in nitrogen-deficient GaN", MRS Internet J. Nitride Semicond. Res, G6.43, pp. 1-6, 1999.	—
	AY	KLEBER, W., et al., "Zur epitaxie von galliumnitrid auf nichtstochiometrischem spinell im system GaCl/NH ₃ /He", CRYSTAL RESEARCH AND TECHNOLOGY, Vol. 10, No. 7, pp. 747-758, 1975. (English Abstract)	—
	AZ	SEIFERT, A., "Nachweis von stapelfehlern in GaN-epitaxieschichten mittels elektronenbeugung", CRYSTAL RESEARCH AND TECHNOLOGY, Vol. 10, No. 7, pp. 741-746, 1975. (English Abstract)	—
Examiner Signature <i>James V. Annunzio</i>		Date Considered	7-12-05

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

1 Unique citation designation number. 2 See attached Kinds of U.S. Patent Documents. 3 Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4 For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 5 Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. 6 Applicant is to place a check mark here if English language Translation is attached.

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W	BA	6,533,874	B1	VAUDO, et al.	03/18/2003	
	BB	4,627,064		AUZEL, et al.	12/02/1986	
	BC	4,000,977		FALCKENBERG	01/04/1977	
	BD					
	BE					
	BF					
	BG					
	BH					
	BI					
	BJ					
	BK					

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	BL							<input type="checkbox"/>
	BM							<input type="checkbox"/>

PUBLICATIONS

Examiner Initials *	Cite No. 1	Title of Publication	Date of Publication of Cited Document MM-DD-YYYY
J	BW	OHSATO, H., et al., "Epitaxial orientation and a growth model of (0 0 • 1) GaN thin film on (1 1 1) spinel substrate", JOURNAL OF CRYSTAL GROWTH, Vol. 189/190, pp. 202-207, 1998.	
	BX	YANG, H. -F., et al., "Microstructure evolution of GaN buffer layer on MgAl ₂ O ₄ substrate", JOURNAL OF CRYSTAL GROWTH, Vol. 193, pp. 478-483, 1998.	
	BY	DUAN, S., et al., "MOVPE growth of GaN and LED on (1 1 1) MgAl ₂ O ₄ ", JOURNAL OF CRYSTAL GROWTH, Vol. 189/190, pp. 197-201, 1998.	
	BZ	SHELDON, R., et al., "Cation Disorder and Vacancy Distribution in Nonstoichiometric Magnesium Aluminate Spinel, MgO • Al ₂ O ₃ ", J. AM. CERAM. SOC., Vol. 82, No. 12, pp. 3293-3298, 1999.	
Examiner Signature	James Vannucci		Date Considered 7-12-05

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Sheet 3 of 3

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Examiner Initials *	Cite No.1	Title of Publication	Date of Publication of Cited Document MM-DD-YYYY
W	AAA	KULESHOV, N.V., et al. "Co-doped spinels: promising materials for solid state lasers", LONGER WAVELENGTH LASERS AND APPLICATIONS, Vol. 2138, pp. 175-182, 1994. XP008017848	—
	AAB	KULESHOV, N.V., et al., "Absorption and luminescence of tetrahedral Co ²⁺ ion in MgAl ₂ O ₄ , Vol. 55, no. 5-6, pp. 265-269, 1993. XP008017849	—
	AAC	NIKISHIN, S.A., et al., "Gas source molecular beam epitaxy of GaN with hydrazine on spinel substrates", APPLIED PHYSICS LETTERS, Vol. 72, No. 19, pp. 2361-2363, 1998. XP000755963	—
	AAD	HAISMA, et al., "Lattice constant adaptable crystallographics", JOURNAL OF CRYSTAL GROWTH, Vol. 102, pp. 979-993, 1990. XP002250056	—
	AAE	TAMURA, K., et al., "Epitaxial growth of ZnO film on lattice-matched ScAlMgO ₄ (0001) substrates", JOURNAL OF CRYSTAL GROWTH, Vol. 214-215, pp. 59-62, 2000. XP004200964	—
	AAF	WYON, et al., "Czochralski growth and optical properties of magnesium-aluminum spinel doped with nickel", JOURNAL OF CRYSTAL GROWTH, Vol. 79, pp. 710-713, 1986. XP002250057	—
	AAG	TSUCHIYA, T., et al. "Epitaxial growth of InN films on MgAl ₂ O ₄ (1 1 1) substrates", JOURNAL OF CRYSTAL GROWTH, Vol. 220, pp. 185-190, 2000.	—
	AAH	KURAMATA, Akito, et al., "High-quality GaN epitaxial layer grown by metalorganic vapor phase epitaxy on (111) MgAl ₂ O ₄ substrate", APPL. PHYS. LETT., Vol. 67, No. 17, pp. 2521-2523, 1995.	—
	AAI	MITCHELL, T., "Dislocations and Mechanical Properties of MgO-MgAl ₂ O ₃ spinel single crystals", J. AM. CERAM. SOC., Vol. 82, No. 12, pp. 3305-3316, 1999.	—
	AAJ	HELLMAN, E., "Exotic and Mundane substrates for gallium nitride heteroepitaxy", BELL LABORATORIES, THC2, Murray Hill, NJ.	—
	AAK	KRUGER, M.B., et al., "Equation of state of MgAl ₂ O ₄ spinel to 65 GPa", THE AMERICAN PHYSICAL SOCIETY, Vol. 56, No. 1, pp. 1-4, 1997.	—
	AAL	KURAMATA, A., et al., "Properties of GaN epitaxial layer grown on (111) MgAl ₂ O ₄ substrate", SOLID-STATE ELECTRONICS, Vol. 41, No. 2, pp. 251-254, 1997.	—
	AAM	GRITSYNA, V., et al., "Structure and Electronic states of defects in spinel of different compositions MgO · n MgAl ₂ O ₃ · Me", J. AM. CERAM. SOC. Vol. 82, No. 1, pp. 3365-3373, 1999.	—
Examiner Signature	James Vannucci		Date Considered 7-12-05

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet 1 of 1
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Complete if Known
Applicant Number 10/669,145
Filing Date September 23, 2003
First Named Inventor Milan R. Kokta
Group Art Unit
Examiner Name
Attorney Docket Number 1035-BI3918-CIP

U.S. PATENT DOCUMENTS

Examiner Initials *	Cite No. 1	U.S. Patent Document Number	Kind Code 2 (if known)	Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
JW	AA	4,493,720		Gauthier, et al.	01/15/1995	—
	AB	5,644,400		Mundt	07/01/1997	—
	AC	5,768,335		Shahid	06/16/1998	—
	AD	5,825,913		Rostami, et al.	10/20/1998	—
	AE	5,822,213		Huynh	10/13/1998	—
	AF	6,021,380		Fredriksen, et al.	02/01/2000	—
	AG	4,819,167		Cheng, et al.	04/04/1989	—
	AH					
	AI					
	AJ					

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	AK							<input type="checkbox"/>
	AL							<input type="checkbox"/>
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PUBLICATIONS

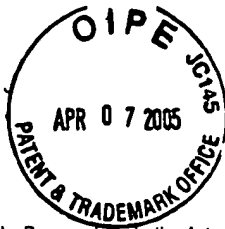
Examiner Initials *	Cite No. 1	Title of Publication	Date of Publication of Cited Document MM-DD-YYYY
	AW		
	AX		
	AY		
	AZ		

Examiner Signature	<i>James Vannucci</i>	Date Considered	7-12-05
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PTO/SB/08A (08-03)

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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

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Sheet 1 of 3

Complete if Known

Application Number	10/669,145
Filing Date	September 23, 2003
First Named Inventor	Milan R. Kokta
Art Unit	2828
Examiner Name	Minsun Oh Harvey
Attorney Docket Number	1035-BI3918-CIP

U. S. PATENT DOCUMENTS					
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		Number-Kind Code ² (if known)			
JW	AA	US- 3,625,868	12/07/1971	Grabmaier et al.	—
	AB	US- 3,736,158	05/29/1973	Cullen et al.	—
	AC	US- 3,816,906	06/18/1974	Falckenberg	—
	AD	US- 3,883,313	05/13/1975	Cullen et al.	—
	AE	US- 3,885,978	05/27/1975	Doi et al.	—
	AF	US- 3,990,902	11/09/1976	Nishizawa, et al.	—
	AG	US- 3,950,504	04/13/1976	Belding et al.	—
	AH	US- 4,370,739	01/25/1983	Wang et al.	—
	AI	US- 4,755,314	07/05/1988	Sakaguchi et al.	—
	AJ	US- 5,138,298	08/11/1992	Shino	—
	AK	US- 5,850,410	12/15/1998	Kuramata	—
	AL	US- 6,533,874 B1	03/18/2003	Vaudo et al.	—
	AM	US- 2003/0188678 A1	10/09/2003	Kokta et al.	—
	AN	US- 6,839,362 B2	01/05/2005	Kokta et al.	—
	AO	US- 6,844,084 B2	01/18/2005	Kokta et al.	—
	AP	US- 3,424,955	01/28/1969	Seiter et al.	—
	AQ	US-			
	AR	US-			
	AS	US-			

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Examiner Initials*	Cite No. ¹	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T ⁶
		Country Code ³ Number ⁴ Kind Code ⁵ (if known)				
JW	AT	FR 1,471,976	03/24/1966	Siemens Aktiengesellsc.	Corr. 3,424,955	
	AU	JP 11-157997	06/15/1999	Kyocera Corporation	Abstract Only	
	AV	JP 09-278595	10/28/1997	Sumitomo Elect. Ind. Ltd.	Abstract Only	
	AW	JP 62-188325	08/17/1987	Sumitomo Elect. Ind. Ltd.	Abstract Only	
	AX	JP 58-211736	12/09/1983	Toshiba Corporation	Abstract Only	
	AY	JP 07-307316	11/21/1995	Sumitomo Elect. Ind. Ltd.	Abstract Only	

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Application Number	10/669,145
Filing Date	September 23, 2003
First Named Inventor	Milan R. Kokta
Art Unit	2828
Examiner Name	Minsun Oh Harvey
Attorney Docket Number	1035-BI3918-CIP

Sheet **2** of **3****U. S. PATENT DOCUMENTS**

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	BA	US-			
	BB	US-			
	BC	US-			
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		Country Code ² Number ³ Kind Code ⁴ (if known)				
GW	BT	EP 0 762 930 B1	07/12/2000	BP Amoco Corporation		
GW	BU	EP 0 263 171 B1	11/25/1992	UOP		
GW	BV	WO 01/99155 A2	12/27/2001	Nichia Corporation		
GW	BW	WO 02/95887 A2	11/28/2002	SG Ceramics & Plastics Inc.		
	BX					
	BY					

Examiner Signature	<i>James Vannucci</i>	Date Considered	7-12-05
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		Art Unit	2828		
		Examiner Name	Minsun Oh Harvey		
Sheet	3	of	3	Attorney Docket Number	1035-BI3918-CIP

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
JV	CA	Giess et al., "Growth of Single Crystal MgGa ₂ O ₄ Spinel", IBM TECHNICAL DISCLOSURE BULLETIN, Vol. 15, no. 1, June 1972, pgs 151-152, XP-002315746.	-
	CB	Anon., "Spinel Crystals for Electronic Devices", MANUFACTURING TECHNOLOGY NOTE, Vol. NTN-77, no. 0735, April 1977, XP-002315747.	-
	CC	Grabmaier et al., "Czochralski Growth of Magnesium-Aluminum Spinel", J. AMERICAN CERAMIC SOCIETY, Vol. 51, no. 6, June 1968, pgs 355-356, XP-002315185.	-
	CD	Wyon et al., "Czochralski Growth and Optical Properties of Magnesium-Aluminum Spinel Doped with Nickel", JOURNAL OF CRYSTAL GROWTH, NORTH-HOLLAND PUBLISHING CO. AMSTERDAM, NL, Vol. 79, no. 1-3, part 2, 1986, pgs 710-713, XP-002250057.	-
	CE	Pinckney, L.R., "Transparent, high strain point spinel glass-ceramics", JOURNAL OF NON-CRYSTALLINE SOLIDS, Vol. 255, pp. 171-177, 1999.	-
	CF	Nakamura, S. "Current Status and Future Prospects of InGa _N -Based Laser Diodes", ISAP INTERNATIONAL, Vol. 1, pgs. 5-17, 2000.	-
	CG	Kisailus D., et al., "Growth of Epitaxial GaN of LiGaO ₂ Substrates Via a Reaction With Ammonia", J. MATER. RES., Vol. 16, no. 7, pgs 2077-2081, 2001.	-
	CH	Nakamura, S., et al., "InGa _N MQW LDs Grown on MgAl ₂ O ₄ Substrates," In THE BLUE LASER DIODE, (NY: Springer-Verlag), pp. 233-243, 1997 (update included).	-
	CI	Mordoc, H., et al., "Large-band-gap SiC, III-V nitride, and II-VI ZnSe-based Semiconductor Device Technologies", J. APPL. PHYS., Vol. 76, no. 3, pgs 1363-1398, 1994.	-
	CJ		

Examiner Signature	<i>James Vannucci</i>	Date Considered	7-12-05
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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

Sheet 1 of 1

Complete if Known

Application Number	10/669,145
Filing Date	September 23, 2003
First Named Inventor	Milan R. Kokta
Art Unit	2828
Examiner Name	Minsun Oh Harvey
Attorney Docket Number	1035-BI3918-CIP

U. S. PATENT DOCUMENTS

Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ² (if known)			
W ↓ ↓	A	US- 3,808,065	04-30-1974	Robinson, et al.	—
	B	US- 3,898,051	08-05-1975	Schmid	—
	C	US- 4,347,210	08-31-1982	Maguire, et al.	—
	D	US- 5,968,267	10-19-1999	Li	—
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			
	N	US-			
	O	US-			
	P	US-			
	Q	US-			
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	S	US-			

FOREIGN PATENT DOCUMENTS

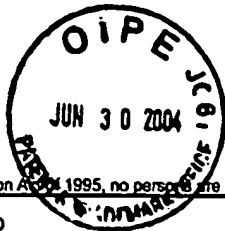
Examiner Initials*	Cite No. ¹	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T ³
		Country Code ² -Number ⁴ -Kind Code ⁵ (if known)				
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Examiner Signature <i>James Vannucci</i>	Date Considered 7-12-05
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Sheet 1 of 3

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Application Number	10/669,145
Filing Date	September 23, 2003
First Named Inventor	Milan R. Kokta
Art Unit	4775 2828
Examiner Name	UNASSIGNED
Attorney Docket Number	1035-BI3918-CIP

U. S. PATENT DOCUMENTS					
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		Number-Kind Code ² (if known)			
↓	AA	US- 4,963,520	10/16/1990	Yoo, et al.	—
	AB	US- 5,982,796	11/09/1999	Kokta, et al.	—
	AC	US- 5,654,973	08/05/1997	Stultz, et al.	—
	AD	US- 5,557,624	09/17/1996	Stultz, et al.	—
	AE	US- 6,366,596	04/02/2002	Yin, et al.	—
	AF	US- 6,023,479	02/08/2000	Thony, et al.	—
	AG	US-			
	AH	US-			
	AI	US-			
	AJ	US-			
	AK	US-			
	AL	US-			
	AM	US-			
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James Vannucci

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Application Number	10/669,145
Filing Date	September 23, 2003
First Named Inventor	Milan R. Kokta
Art Unit	1775 2828
Examiner Name	UNASSIGNED
Attorney Docket Number	1035-BI3918-CIP

Sheet

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of

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NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
JW	BA	Efimov, A.N., et al., "Onan Unusual Azimuthal Orientation Relationship in the System Gallium Nitride Layer on Spinel Substrate", CRYSTALLOGRAPHY REPORTS, 45(2): 312-317 (2000).	-
	BB	Sun C.J., et al., "Mg-doped green light emitting diodes over cubic (1 1 1) MgAl ₂ O ₄ substrate", APP. PHYS. LETT. 72(19): 2361-2363 (1998).	-
	BC	Efimov, A.N., et al., "Symmetry constraints and epitaxial growth on non-isomorphic substrate", THIN SOLID FILMS 260: 111-117 (1995).	-
	BD	George, T., et al., "Novel symmetry in the growth of gallium nitride on magnesium aluminate substrates", APPL. PHYS. LETT. 68(3): 337-339 (1996).	-
	BE	Sun C.J., et al., "Deposition of high quality wurtzite GaN films over cubic (1 1 1) MgAl ₂ O ₄ substrates using low pressure and metalorganic chemical vapor deposition," APPL. PHYS. LETT. 68(8): 1129-1131 (1996).	-
	BF	Nakamura, S., et al., "Characteristics of InGa _N multi-quantum-well-structure laser diodes," APPL. PHYS. LETT. 68(23): 3269-3271 (1996).	-
	BG	Khan, M.A., et al., "Cleaved cavity optically pumped InGa _N -Ga _N laser grown on spinel substrates," APPL. PHYS. LETT. 69(16): 2418-2420 (1996).	-
	BH	Tempel, A., et al., "Nachweis von Stapelfehlern in GaN-Exitaxieschichten mittels Elektronenbeugung," KRISTALL UND TECHNIK 10(7): 741-746 (1975).	-
	BI	Tempel, A., et al., "Zur Epitaxie von Galliumnitride auf nichtstoechiometrischem Spinell im System GaC ₁ /NH ₃ /He," KRISTALL UND TECHNIK 10(7): 747-758 (1975)	-
	BJ	K.V. Yumashev, "Saturable absorber Co ²⁺ : MgAl ₂ O ₃ crystal for Q switching of 1.34-um Nd ³⁺ : YAlO ₃ and 1.54-um Er ³⁺ : glass lasers," APPLIED OPTICS 38(30): 6343-6346 (1999).	-

Examiner Signature	<i>James Vannucci</i>	Date Considered	7-12-05
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First Named Inventor	Milan R. Kokta
Art Unit	4775-2828
Examiner Name	UNASSIGNED
Attorney Docket Number	1035-BI3918-CIP

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of

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NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
ju	CA	Camargo, M.B., et al., "Co2+ Y3Sc2Ga3O12 (YSGG) Passive Q-Switch for Infrared Erbium Lasers," submitted to LEOS in 1994.	-
	CB	Mikhailov, V.P., et al., "Passive Q-switch performance at 1.3u (1.5u) and nonlinear spectroscopy of Co2+: MgAl2O4 and Co2+: LaMgAl11O9 crystals," OSA TOPS VOL. 26 Advanced Solid-State Lasers, pp. 317-324 (1999).	-
	CC	Stulz, R.D., et al., "Divalent Uranium and Cobalt Saturable Absorber Q-Switches at 1.5um," OSA Proceedings on Advanced Solid-State Lasers, 24:460-464 (1995).	-
	CD	Birnbaum, M., et al., "Co2+: ZnSe Saturable Absorber Q-Switch for the 1.54 um Er3+: Yb3+: Glass Laser," OSA TOPS Vol. 10 Advanced Solid State Lasers, pp. 148-151 (1997).	-
	CE	Machida, H., et al., "difficulties encountered during the Czochralski growth of TiO2 single crystals," JOURNAL OF CRYSTAL GROWTH, 112: 835-837 (1997).	-
	CF	Camargo, M.B., et al., "Broad-band 1.54 um Saturable Absorber Q-switch with Co2+," submitted to ASSL in 1995.	-
	CG	Yumashev, K.V., et al., "Nonlinear spectroscopy and passive Q-switching operation of a Co2+: LaMgAl11O19 crystal," J. OPT. SOC. AM. B., 16(12): 2189-2194 (1999).	-
	CH		
	CI		
	CJ		

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Signature

James Vannucci

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